CLAIMS

1. A self-propelled working robot, comprising a first distance sensor for measuring a distance to an obstacle in a front direction of the robot, and a second distance sensor for measuring a distance to the obstacle in a diagonally forward direction of the robot, the robot comprising:

first determination means for comparing a first measured distance to the obstacle obtained by the first distance sensor with a predetermined first threshold value (SHc) to determine proximity to the obstacle;

second determination means for comparing a second measured distance to the obstacle obtained by the second distance sensor with a predetermined second threshold value (SHr) to determine proximity to the obstacle; and

changing means for changing the first or second threshold value based on information regarding an inclination angle of the obstacle obtained from the first and second measured distances.

2. A self-propelled working robot according to claim 1, wherein, irrespective of a magnitude of the inclination angle, the robot obtains a determination result from the first determination means as to proximity to the obstacle and a determination result from the second determination means as to proximity to the obstacle, and concludes that the robot is proximate to the obstacle if either one of the two determination results indicates that the obstacle is proximate.

3. A self-propelled working robot according to claim 1, wherein the changing means sets the first or second threshold value (SHc or SHr) so that the first or second threshold value (SHc or SHr) increases as the inclination angle increases.

4. A self-propelled working robot according to claim 1, wherein the first and second distance sensors are arranged close to each other.

5. A self-propelled working robot according to claim 1, wherein the robot obtains information regarding the inclination angle based on an arrangement of the first and second distance sensors, light emitting directions of the first and second distance sensors, and the first and second measured distances.

6. A self-propelled working robot according to claim 1, wherein:

the first and second distance sensors are optical distance sensors;

the first distance sensor is provided in a head portion of the robot located at a center of the robot in a left-right direction;

a pair of the second distance sensors are provided on both sides of, and close to, the first distance sensor; and

ultrasonic distance sensors for measuring a distance to the obstacle in the front direction of the robot are provided in both side portions of a front end portion of the robot, in addition to the first and second optical distance sensors.

7. A self-propelled working robot according to claim 1, wherein:

the first and second distance sensors are optical distance sensors;

the first distance sensor is provided in a head portion of the robot located at a center of the robot in a left-right direction;

a pair of the second distance sensors are provided on both sides of, and close to, the first distance sensor; and

a protection cover is provided in the head portion of the robot, the protection cover having a recess with three side surfaces and a ceiling surface, wherein the three sensors are closely facing the three side surfaces; and

a third distance sensor is provided on an inner position opposed to the ceiling surface for measuring a distance to a position in front of, and diagonally below, the third distance sensor.

8. A self-propelled working robot according to claim 1, further comprising:

a traveling assembly having a wheel rotating on a floor surface;

a working assembly for doing work on the floor surface, wherein the working assembly is attached to the traveling assembly so that the working assembly is movable in a left-right direction with respect to the traveling assembly;

a moving mechanism for moving the working assembly with respect to the traveling assembly so as to change a positional relationship between the traveling assembly and the working

assembly;

a first contact sensor provided in the working assembly for detecting a contact of the obstacle with a front surface of the working assembly;

a second contact sensor provided in the working assembly for detecting a contact of the obstacle with a side surface of the working assembly; and

control means for controlling a travel of the traveling assembly, for controlling the moving mechanism to move the working assembly left and right at a first retraction speed based on a detection signal from the first contact sensor, and for controlling the moving mechanism to move the working assembly left and right at a second retraction speed, being lower than the first retraction speed, based on a detection signal from the second contact sensor.

9. A self-propelled working robot according to claim 8, wherein the control means has a function to stop the travel if a time for which a contact is being detected by the first contact sensor is longer than a predetermined time (H).

10. A self-propelled working robot according to claim 9, wherein the predetermined time (H) is set to a small value when a traveling speed is high, and is set to a large value when the traveling speed is low.

11. A self-propelled working robot according to claim 1, further

comprising:

a traveling assembly capable of rotating in place about a vertical line to a floor surface;

a working assembly for doing work on the floor surface, wherein the working assembly is attached to a front or a rear of the traveling assembly;

rotation angle measurement means for measuring a rotation angle of the traveling assembly about the vertical line;

storage means for storing the rotation angle;

a plurality of front distance measurement means provided on the traveling assembly and spaced apart from each other in a width direction of the traveling assembly for measuring a distance to a front obstacle located in a moving direction of the traveling assembly;

side distance measurement means for measuring a distance to a side obstacle located sideways with respect to the moving direction of the traveling assembly;

determination means for determining, based on a plurality of measured values obtained by the side distance measurement means, whether or not the traveling assembly is traveling along a side wall; and

control means for controlling a traveling operation of the traveling assembly, wherein:

the control means determines that, when a measured value obtained by at least one of the plurality of front distance measurement means is less than or equal to a predetermined stop limit distance (SHd), the traveling assembly is close to the front

obstacle in front of the robot and stops the travel of the traveling assembly, and the control means compares the measured values of the plurality of front distance measurement means with one another to determine whether or not a difference or a ratio between measured distances to a surface of the front obstacle is within a predetermined range, wherein if it is determined that the difference or the ratio between the measured distances is outside the predetermined range, the control means controls the traveling assembly to rotate in place about the vertical line until the difference or the ratio between the measured distances is within the predetermined range, and stores in the storage means the rotation angle of the traveling assembly when the difference or the ratio falls within the predetermined range; and

if it is determined by the determination means that the traveling assembly has been traveling along a side wall before the rotating operation, the control means controls a traveling operation of the traveling assembly so that the robot does work on a corner area formed by the side wall and the front obstacle in front of the robot and then travel along the front obstacle in front of the robot based on the rotation angle stored in the storage means.